PROLAPSUS OF THE RECTUM IN CHILDREN.[1]

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ALL cases of true prolapse of the rectum will show by inspection of the parts that a tumor projects out of the anus, but the form that this tumor takes will vary greatly from one case to another. The most frequent form is a sausage-shaped tumor, while at other times the mass may be conical, globular, or pear-shaped; a few cases have been reported in which the prolapsed gut was sickle-shaped. The length of the prolapsed portion varies very greatly, and in the mildest types it may not be more than six centimetres in length; but it may reach seventy-five centimetres or more. When a prolapsed rectum is not very long, its circumference is usually proportionately greater, and, in the adult, I have known of a case in which the circumference reached forty centimetres. In all cases the tumor is coated with mucous membrane.

At the base of the tumor there will usually be found a sulcus existing between the mucous membrane of the prolapsed gut and the skin of the anal orifice. This sulcus varies in depth according to whether the case is one of prolapse of the rectum or an invaginated colon, so that by passing the finger along this sulcus the point of inversion may be determined. In some few cases the sulcus is situated so high up that the finger may not be able to reach it. In only a few instances will the mucous membrane of the bowel form a direct continuation with the integuments of the anus, in which case no sulcus will apparently be present, although when operated on it will be found. This fact can be explained if we assume that the lowest part of the rectum has become completely inverted.

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In almost all cases the lumen of the gut may be seen in the centre of the tumor; its shape varies, sometimes being oblong, and, at others, star-shaped, and through which fæces and, in some cases, a bloody or mucopurulent discharge makes its exit. An interesting case has been reported in which, at the lower end of the prolapsus, was found a circular, cicatricial stenosis, which had probably been the cause of the prolapsus.

A point which always should be considered is whether or not there is an inclusion of the peritoneum in cases of prolapsus; and, in order to understand it, a few words on the anatomy of the parts may not be out of place. The peritoneum covers the anterior and lateral surfaces of the rectum, and becomes attached to the third sacral vertebra, which is the termination of the iliopelvic mesocolon. From the third sacral vertebra the peritoneum descends along the lateral surfaces, then lower down on the anterior of the rectum, and detaches itself from the gut in a curved line, forming a horse-shoe with its concavity directed backward and upward, and then reflects forward onto the bladder in the male, and on the uterus in the female. The terminal portion of the rectum, at least for its lower two-thirds, is consequently extraperitoneal. The bottom of the vesicorectal and vaginorectal culs-de-sac are situated at about seven centimetres above the anus, and consequently it is easily understood that the tumor formed by the prolapsed intestine must be of considerable size in order that the serous membrane can become insinuated between the two cylinders of gut forming the invagination.

We, unfortunately, have no clinical guide by which we can detect the presence of the peritoneum in the tumor; but it is evident that the portion of the rectum which is surrounded by peritoneum cannot become invaginated in the part situated below without drawing the serous membrane along with it, which consequently would be found at the anterior part of the tumor. Fortunately, this occurrence is certainly rarely met with, because if it were otherwise each time that incision is practised for a prolapsus the peritoneal cavity would be opened.

Another complication that we should also bear in mind is the possibility of the presence of the small intestine in the

invagination, and cases have been known where knuckles of the small gut have become strangulated in the anterior cul-de-sac of the invagination. All writers on this subject have indicated, as a pathognomonic sign, a gurgling sound, such as is heard in ordinary hernia, when the prolapsus has been reduced by digital manipulation; and Gosselin has pointed out that if the patient is made to cough the anterior aspect of the prolapsus will swell when small intestine is present within it. Allingham has also given another sign, namely, that the orifice which is usually found at the apex of the prolapsus is always directed backward towards the sacrum when this affection is complicated by a hernia of the small intestine, and this sign has been accepted by a large number of authors.

In most works on surgery the writers give, as an etiology of prolapsus of the rectum in children, fits of coughing, difficulty in passing the stools, and a defect in the curve of the sacrum, in which case the intestine is suspended, so to speak, in the midst of the pelvis. We do not wish to say that attacks of coughing or constipation may not be the etiological factor of prolapsus; but, in our way of thinking, one of the most important causes is certainly *infection*, whether it is produced by a retention of the fæces, or by diarrhœa which is produced by the bacteria of the gut; and the pathologic changes which take place in the walls of the intestine certainly deprive it of its tonicity and render it lax. Of course, this applies to young children.

In older children and adults the prolapsus is often due to the presence of a polypus, an ulcer, hæmorrhoids, or some other lesion of the rectum; and, when examining a case of prolapsus, the surgeon should never neglect to ascertain if some one of these lesions is not present.

On account of the friction to which a prolapsus of the rectum exposes the mucous surface of the gut, the latter undergoes more or less change. Aside from the fact that the surface, becoming excoriated, is covered with either a bloody or purulent mucus, or with necrotic threads of epithelium, there exists in a good many cases a complete loss of the epithelial structures, and consequent ulceration. In one case that I have observed there were two extensive abscesses, and in other cases, including

one here reported, polypus-like granulating growths were present. In almost all cases of prolapsus a more or less violent hæmorrhage will take place at some time or other.

The duration of prolapsus of the rectum is very variable. In some cases it may have existed for a few months, while in others the affection may have been present for several years; and we often find young people or adults who have suffered from the trouble since early childhood.

Generally speaking, the majority of cases of chronic prolapsus can be reduced after the patient has been to stool, and in some subjects where the slightest amount of exertion, either sitting or standing, would cause the bowel to prolapse, it could be reduced every time it came down. Of course, this means a great deal of torment for the patient, on account of the continual trouble and annoyance to which he is put. But, nevertheless, it may be said that, in a large number of cases, defecation is rather painful, and, in some cases, incontinence of the fæces may be present, while in others there will be considerable irritation of the bladder, which is harder to bear than the prolapsus itself. Some of these cases of chronic prolapsus recti, which could have been easily reduced in the beginning, become irreducible after a certain length of time, and adhesions form between the two serous surfaces of the intestine. Others become irreducible from the fact that they have become incarcerated by the sphincter ani. In these cases the mucous membrane will be found uniformly swollen, œdematous, very hyperæmic, and of a dark-red to bluish color, or even black, and in some cases gangrene will have already taken place.

Besides the so-called chronic forms of prolapsus recti, there are other cases where the condition commences very acutely and is accompanied by serious symptoms, such as nausea, vomiting, fever, or collapse. In these cases the prolapsed rectum will be found very œdematous, with hæmorrhagic foci on its surface, and, when felt, it will be found extremely cold. The general health of the patient is interfered with in almost all cases. Generally speaking, prolapsus of the rectum is either due to some other pathologic condition of the organ, as we have

already pointed out, or else to some digestive disturbance, and, consequently, in the latter class of cases the patients are apt to be thin and anæmic.

Regarding the diagnosis, it may be said that prolapsus of the rectum, in variable degrees of severity, is frequently associated with hæmorrhoids, so that one affection is frequently mistaken for the other; but where the prolapsus is not very marked, it is usually as easily cured by local treatment as are hæmorrhoids. This applies only to adults, as children and young adults are not liable to hæmorrhoids. In children, prolapsus of the rectum is often produced by polypus growth, whether sessile or otherwise, as well as to all degrees of bowel irritation, ulceration, and chronic infection of the rectum, accompanied by a diarrhœa, ulceration, and other conditions of the gut. It is also met with in cases where, for some reason or other, the anal sphincter is in a state of atony, as, for instance, in cases of rectal fistula, requiring extensive operative proceedings.

Generally speaking, however, a prolapsus of the rectum or the mucous membrane of the anus can hardly ever be mistaken for any other tumor; but the surgeon should make it a point to ascertain the variety of prolapsus present in a given case, especially for the purpose of carrying out a proper treatment. Prolapsus of the mucous membrane is usually present in the form of a cone with its base at the anus, and may be aptly compared to the cervix uteri of a nulliparous female. The finger should be introduced into the orifice present in the centre of the growth, while the thumb is pressed on the outer surface, and between them the two layers of mucous membrane can be made to slip over one another.

When we are dealing with a total and complete prolapse, or invaginated rectum, digital examination will show that the thickness of the tissues is considerably greater than normal, and, still more, it will be evident that the mass palpated has more resistance, and that the two layers of fibromuscular tissue composing the tumor are much larger, and cannot be made to move one over the other with as great facility when we are dealing with two invaginated, intestinal cylinders. The presence of the sulcus, when it exists, is a very good diagnostic

point, because it is never met with when the mucous membrane alone is prolapsed. It is also absolutely necessary to exactly ascertain the height of the invagination, on account of the possible presence of the peritoneum in the anterior cul-de-sac.

Reduction of the prolapse should immediately be applied in order to ascertain whether there is any immediate danger of strangulation. If the history of the case is wanting, the duration of the existence of the prolapsus may be estimated by its dark-red color, or even by the dermatoid aspect that the mucous membrane takes on when it has been submitted for a long time to friction by the clothing.

The prognosis of prolapsus of the rectum is never really serious, and, if the affection be treated from the beginning, a cure will usually result. The only serious condition which may arise is when strangulation and resulting gangrene take place.

As in this paper it has only been the intention of the writer to report those cases of prolapsus recti which were really of the severe type, and which required an extensive operation, the three following cases will be reported, and the simpler forms which required medical treatment only will be omitted:

CASE I.—William C., aged three and a half years, was brought for treatment to the Tremont Dispensary in May, 1896. The father and mother are both well, and three other children are in excellent condition. The mother stated that for about two years she had noticed, as she expressed it, a red bunch at the anal orifice, but recently this growth had increased considerably in size, and the child complained of much pain when he went to stool.

Examination showed a cylindrical tumor measuring about five centimetres in all its dimensions; it was of a rather dark-red color, and at the most prominent part an orifice was seen, which gave issue to a liquid fæces. Careful digital examination failed to reveal the presence of a polypus or other morbid condition of the rectum, and a diagnosis of prolapsus recti was made. The prolapsus could be reduced easily. When the finger was introduced into the rectum and the prolapsed portion seized between this finger and the thumb, the tissues were found very thick, indicating that the prolapsus was

total. Around the anus there was a sulcus measuring about two centimetres in depth.

After proper preparation of the bowel, five longitudinal lines were made with the thermocautery, care being taken to only destroy the mucous membrane of the gut, which was then reduced, after having been covered with a layer of dermatol ointment.

The child was brought back to us about six weeks later, as the mother had found that the tumor returned, and was as evident as before the cauterization, so it was decided to perform a radical cure. After a profound ether narcosis had been obtained, the tumor was grasped on each side at its lowest part with a pair of artery-forceps. On the left side an incision was made with the scissors, extending up the entire length of the tumor, and then, with the scissors, all the parts forming the hernia were excised at the base. The mucous membrane was sutured to the skin with fine silk. We then proceeded to excise a triangular bit of mucous membrane and skin at the posterior aspect of the anus, which was then sutured with silk.

The sutures were eliminated spontaneously eleven days after the operation, and the child was discharged cured. He was seen about four months after the operation, and no recurrence of the trouble had taken place.

CASE II.—Mary C., aged nineteen months. Both parents are alive and well, as are six other brothers and sisters. The patient was born at term and labor was normal. The child was well until about the age of three months, at which time she presented certain signs of irritability, and also diarrhœa. The diarrhœa lasted for a number of weeks, although the patient was under the care of a physician, and during this time the rectum was noticed to protrude at each stool, its extent being about two centimetres. The attending physician ordered that the rectum be reduced each time it prolapsed; but this was not of much avail, and every time the child would cry, the abdominal pressure would cause the prolapsus to protrude more and more, so that finally it became of considerable size.

Although the child was situated in very favorable surroundings, its general health was not good, and it did not make the proper weight. For the last four months, the motions have been regular and well formed, but the patient is very restless, and cries every time the bowels move, especially when the fæces are hard. For the last four months, the prolapse has, apparently, not increased, and at present it measures about fourteen centimetres long. It can be re-

duced with only the greatest difficulty, and reduction causes great pain to the patient. The surface of the mucosa is covered by numerous granulations, and is of a dark-violet color. As gangrene appeared imminent, immediate operation was advised and accepted by the parents.

After the child was etherized, the prolapsus was thoroughly disinfected, and Mikulicz's operation was carried out as in the descrip-

FIG. 1.—Prolapse of the rectum, Case III.

tion of the technique, which will be considered later on in this paper. No hernia of the small intestine was found, and the peritoneal cavity was closed with a running suture of fine catgut. After the slight hæmorrhage had been controlled, the mucous membrane was stitched to the anal skin with interrupted chromic catgut sutures, seven of these being necessary. The child made an uneventful recovery, and three weeks after the operation was playing about, in fine spirits.

When seen about eight months after the operation, the condition of the anus was excellent, and no return of the trouble was evident.

CASE III.—This case was under my observation in the service of Professor Julliard, of Geneva, and represents the most complete prolapsus of the rectum that I have ever seen. It was a child about six years old, who had had this condition of affairs present ever since babyhood, and which had been allowed to run on until the rectum hung down and reached the level of the popliteal space, as this photograph (Figure 1) will show. Circular resection of the rectum was performed, the borders of the gut were united to the anal skin, and recovery was uneventful.

In the large majority of cases, prolapsus of the rectum in children will readily yield to medical treatment if instituted early. The judicious use of a rubber rectal-plug to keep the prolapse reduced, cleanliness, and tonic treatment with the use of strychnine will, probably, give the best of results. If the prolapsus has for etiological factor a polypus, hæmorrhoids, or other local lesion, it is very evident that the surgeon's efforts should be directed towards the cure of the latter, and generally, after this has been accomplished, a proper medical treatment will do away with the prolapsus, if it is not too far advanced.

When a prolapsus has reached a certain stage, when it has become irreducible, or when it has become constricted by the sphincter ani and gangrene is imminent, resection of the prolapsed part is the method of choice.

The preparation of a patient for the operation is similar to that employed in all operations on the intestine. A complete evacuation of the bowels by the use of laxatives and enemas is necessary, but, of course, if we are dealing with a case where the gut has become strangulated from constriction of the anal sphincter, the use of purgatives or cleansing enemas cannot be resorted to. A few hours before the operation, I like to have tincture of opium given in sufficient quantity to quiet the intestines during, and for some little time after, the operation. The field of operation is thoroughly disinfected, and, during the operation, the free use of mild antiseptics, when necessary, should be resorted to. The patient should be placed in the lithotomy position.

As to the technique of the operation, it varies very greatly, and almost every surgeon has devised some method of his own. Some produce an artificial anæmia by applying a rubber tube around the base of the tumor, and this is prevented from sliding off by transfixing the gut with a long needle, just as is done in Wyeth's amputation of the hip-joint. The prolapsus is then sutured to the circumference, five or six sutures usually being enough, and then the tumor is simply removed by scissors or knife. Hæmorrhage is extremely slight. Raye and Volkmann operate in this way, with the exception that they do not resort to artificial anæmia; they both suture the bowel first, and then perform resection below the line of sutures. Volkmann stitches the mucosa of the anus and that of the rectum, which is situated a little higher up, with a fine stitch. Raye, not being satisfied that he had closed the abdominal cavity by means of his circular sutures, thought it more prudent to peel back the peritoneal cul-de-sac very carefully off the gut, and then ligated it at its neck with catgut, cut off the sac thus formed, and allowed it to retract into the pelvis, and by doing this he dealt with a condition just as we do in the radical operations for hernia.

Some French surgeons, especially Nélaton, Segond, and Trelat, employ a somewhat different technique; their chief point being to operate with as complete an artificial anæmia as possible. Two long clamps are placed parallel to each other and side by side on each half of the prolapsed gut, so that one blade of the forceps is placed within the lumen of the prolapsus, while the other remains outside. The gut is then slit open between the clamps in its entire length up to the anus, the result being that the prolapsus is divided into halves, forming an anterior and posterior flap without any hæmorrhage whatsoever; Nélaton divides the prolapsus laterally, making two lateral flaps. Next comes the resection of the two flaps, and the introduction of the sutures. The resection is carried out in such a manner that the clamps are first applied across the base of the flaps, and then resection is carried out by slowly snipping the gut across with scissors, a suture being inserted after each snip. Péan operated on a case where he first divided the prolapsus into an anterior and posterior flap, but he did not

use clamps, employing the rubber tube at the base of the tumor instead.

Treves first endeavors to ascertain the exact nature of the tissues entering into the formation of the prolapsus before resection is done. He does not resort to any form of artificial anæmia, but immediately proceeds to make a circular incision, which simply includes the external mucous membrane, which is carried to the apex of the prolapsus by folding it back like a cuff and attaching the latter; one is thus enabled to obtain a good view of the tissues entering into the formation of the prolapsus. Only after this has been done, resection of the gut is performed by means of small incisions of about two centimetres long, after which forceps are applied until entire resection has been accomplished. The application of the forceps not only prevents hæmorrhage, but also retains the intestine, which cannot glide back out of reach. When resection has been completed, the forceps are removed one after the other, each bleeding vessel being caught up and tied with catgut, and union of the edges of the gut is accomplished by carefully applied silk sutures.

Mikulicz first cuts through the outer intestinal tube in its anterior circumference by cutting the tissues, layer after layer, catching up each bleeding vessel as it appears, and ligating it with fine catgut. As soon as the peritoneal pouch has been opened, its interior is examined for the presence of small intestine. The peritoneal cavity is then closed by a running suture. The anterior aspect of the internal intestinal tube is cut through little by little until it is opened, and then both intestinal tubes are united by deep silk sutures to the entire line of the incision.

The posterior circumference of the prolapsus is treated in absolutely the same way, both intestinal ends being united by means of silk sutures, and thus the resection is completed. Mikulicz's method has been followed by Billroth, Nicoladoni, Bogdanik, Heinecke, Natlakowski, and Helferich, with the exception of Billroth, who, instead of closing the peritoneal sac, left it open and drained. Mikulicz advises against packing the rectum after the operation, as he considers that all dressings placed in

the lumen of the rectum are superfluous, and under certain circumstances may be even dangerous. He simply covers the line of sutures with iodoform, and then places a strip of iodoform gauze over this, which is then in turn covered by a wood-wool cushion, and this is the dressing that I have used. It should be changed every day, or oftener if necessary.

Much attention must be directed to keep the surfaces very clean, and for this purpose a daily irrigation with a mild antiseptic solution, such as boracic or salicylic acid, is of value. Opium should be given internally for about a week following the operation, in order to keep the bowels bound up, and of course the patient must be kept upon a diet that will leave as little intestinal residue as possible.

Now, as regards the various techniques which I have described, I would say that the production of artificial anæmia, either with the clamps, as employed by the French surgeons, or with the rubber tube placed around the base of the tumor, in my opinion are both dangerous and useless. If a man is any kind of an operator, he can certainly easily control the slight amount of hæmorrhage that may occur. The great danger from the use of the clamps or the rubber tube lies in the fact that there may be a hernia of the small intestine, and this we never can diagnosticate with surety until the peritoneal cul-de-sac has been opened. Treves's technique does not appear to us either necessary or particularly advantageous. In our opinion by far the best method to follow is that described by Mikulicz, which has already been detailed. This method can be applied to every case of prolapsus, whether it be small or large, whether it is complicated with intestinal hernia or not, and in all cases the peritoneal cavity can be closed off perfectly. At the same time the operation is simple and easily performed, and in all reported cases the hæmorrhage never amounts to much.

We would also point out that resection of a triangular piece of skin and mucous membrane at the posterior aspect of the anus is a very good complementary operation in those cases where we wish to give greater support to the parts, as was done in Case I.

In the majority of cases recovery after operation for prolapsus recti is simple, and the wound closes in most cases without any reaction; but care must be taken to carefully place the stitches, including tissue enough to prevent them from tearing through. A medium-size silk is perhaps, on the whole, the best material, but a good chromic catgut may sometimes be preferred. In cases of invagination, silk is perhaps the best material to employ.

If diarrhœa should supervene, as it sometimes does, opium in full doses must be exhibited. It is better to keep the bowels confined until about the eighth day, and after this time a daily movement should be obtained. In most cases the passage of the fæces will not produce any pain or loss of blood, and only in very few cases will the operation be followed by fæcal incontinence, which usually will right itself within a short time. Bladder symptoms rarely complicate the convalescence, but occasionally retention of the urine will occur, which lasts a few days. Union of the wound takes place quite rapidly, and generally the patient may be discharged during the third week. In some few cases the process of repair may require a somewhat longer time.

Death from the operation is extremely rare, as far as I can learn; and if the subjects when operated on are found to be in a good general condition, I believe that the mortality ought to be *nil.*

In all the cases with which I am familiar, the result as to the functions of the bowel were excellent, and the disease is not likely to recur if the operation has been properly performed. The movements from the bowels become again normal in every respect, and I am aware of no instance in which incontinence of fæces was present. In those cases where a relaxed sphincter ani was present before the operation, recovery from this infirmity took place, the sphincter regaining its normal tone. I know of no case in which stricture occurred after the operation.

Whether these good results have remained permanent in all cases is impossible surely to say, and a recurrence of the prolapsus may possibly take place, but in all probability the result is permanent.

As I have endeavored to point out, resection of the rectum in cases of prolapsus or invagination is the proper treatment where a faithfully tried medical treatment has been without avail; but in the milder forms, before resorting to this, it is well to try the thermocautery, making several longitudinal incisions, care being taken not to extend deeper than through the mucosa of the rectum. If the result is not satisfactory, then I think we should resort to a resection; but, like everything else in surgery, it is far better policy and judgment to first try the simpler methods at our disposal, and if these fail more radical methods should be adopted.

Within the last few years other operations have been proposed and executed for the relief of the more serious types of prolapsus recti, one of which is due to Jeannel, which he terms colopexia, or by Verneuil colopexotomy. Jeannel makes an incision over the left Poupart's ligament, as is done in Littre's operation of colotomy. The descending colon is then searched for and is drawn up into the wound until the prolapsus is completely reduced. The gut is then stitched to the incision in the abdomen, and then a few days afterwards it is opened in order to obtain an artificial anus. This artificial anus is closed later on, after the adhesions have anchored the bowel securely in place.

In our opinion, however, resection of the prolapse is to be preferred to this method because colopexia is by far more complicated than the former operation, and, besides this, resection can be performed at one sitting, while in Jeannel's operation several interferences are necessary. Besides, it is very disagreeable for a patient to go about with an artificial anus, and all surgeons are fully aware of the difficulty which frequently arises to close an artificial anus. The treatment necessitated by colopexia requires at least from three to four months, while in resection of a prolapsed rectum it is safe to say that the patient will be completely cured by the end of three or, at the latest, four weeks. I do not believe that colopexia presents any greater or surer guarantee of an ultimate recovery than does resection; and it is also evident that the former cannot be indiscriminately performed on each and every case. For instance, if we are dealing with an irreducible prolapsus, if the

gut is in a gangrenous condition, or a stenosis of the lumen of the rectum is present, it is evident that colopexia is out of the question, and resection is the only operation which will meet the demands of the case; but it may be said that, in a case where resection should fail to effect a cure, colopexia might be tried as a last resort.

Of the other methods which have been proposed, I will say nothing, as they appear to me both dangerous and devoid of common sense; and, in conclusion, I would offer the three following propositions:

(1) In the acute types of prolapsus recti and invagination of the colon which are irreducible, and which, at the same time, present other serious general symptoms, such as incarceration, gangrene or intestinal obstruction, no time should be lost; the surgeon should act at once, and this means immediate resection should be performed.

(2) In all cases of chronic and irreducible prolapsus ani, although they do not directly threaten life, they should be removed as soon as possible, because at some future time they will probably be a danger for the patient. These chronic irreducible prolapsus are very prone to impair the general health of the subject, because they interfere with proper nutrition. Rather frequent and somewhat profuse hæmorrhages are liable to occur in these cases, which may be the means of rendering the patient quite anæmic; they frequently become incarcerated, and the consequence is either an inflammation of the rectum or even gangrene. Owing to the fact that this form of prolapse is exposed to external influences of a dangerous nature, extensive ulceration, especially at the apex of the prolapse, cicatricial stenosis of the lumen of the rectum may occur. And, lastly, a hernia of the small intestine into the prolapse may arise. Now all these dangers can be prevented by an early resection, and the earlier this is done the better, because the patient will be in a far better general condition than if the surgeon waits until called upon to operate in haste after some one of these above mentioned complications have set in.

(3) In all cases of chronic reducible prolapsus recti which cannot be cured by milder therapeutic measures, resection is

indicated. I would strongly advise giving medical means only sufficient time to ascertain if any result whatever is to be obtained by them, because in this form of prolapsus the dangers will become considerable the longer the case is allowed to run. If linear cauterization is tried and remains without result, it had better not be repeated, because cicatricial stenosis will certainly occur.